REMARKS

The Office Action dated April 24, 2003 has been reviewed and the Examiner's remarks carefully considered. Claims 12-27 are currently pending in this application. Claims 12, 16 and 18 are amended herewith. Support for the rewording of claim 12 is found, for example, on specification page 3, line 3, which makes clear that the ion-exchange agent is present in the claimed mineral wool substrate, thus making the previous recitation "up to 20 volume %" better understood as a maximum 20% by volume inclusion of the ion-exchange matrix. Support for the language added to claim 16 is found on page 4, line 14. Support for the language added to claim 18 is found on page 4, line 22. No new matter has been added. In view of these amendments and of the following remarks, Applicants believe that all the asserted rejections are in condition for withdrawal and all the claims are in condition for allowance.

Claims 12-19, 21, 22 and 24-26 stand rejected under 35 U.S.C. 103(a) as assertedly being unpatentable over Baron et al. Although the Examiner notes that Baron et al. are silent about (1) the agent being up to 20% volume with an ion-exchange capacity of at least 15 meq/100g dry weight, (2) the ion-exchange agent is having a pore size smaller than that of mineral wool with a density of less than about 72 kg/m^3, (3) clay or substituting up to 20 % volume, and (4) the use of peat, the Examiner asserts that it would have been obvious to one skilled in the art to discover these optimum or workable ranges. Further, the Examiner asserts that the soil minerals disclosed by Baron et al. are similar to those claimed by Applicants, and thus should display the same characteristics as that of Applicants with regard to swelling and shrinking.

The present invention as claimed is a mineral wool substrate comprising a coherent matrix of mineral wool and a maximum 20 volume % of an ion-exchange agent. The ion-exchange agent has an ion-exchange capacity of at least 15 meq/100g dry weight, a pore size less than 25 μm, and may be comprised of an organic substance, preferably sphagnum or peat. Furthermore, the ion-exchange agent has a stable structure, so that it exhibits a non-clay-like behavior with respect to swelling and shrinking. Thus, the critical feature of the present invention is the combination of the coherent matrix of mineral wool fibers and the ion-exchange

agent, which combination solves the problem of excessive swelling and shrinking encountered in prior art growth media.

In contrast to the invention, Baron et al. disclose a **granulate** growth substance support comprised of a superabsorbant material, consisting of a polyacrylamide-polyacrylic acid reticulated copolymer that may contain particles, such as clay, bentonite, zeolite, and fibers, such as ligneous, cellulose, or synthetic fibers, such as textile or mineral wool, purportedly to improve capillarity within the superabsorbant material. Rather than displaying similar characteristics as Applicants' claimed invention, the capillarity-improving agents of Baron et al. disclose the usual enormous swelling and shrinking upon water absorption, which is 60 to 100 times its initial volume (column 3, lines 36-38). The fact that the Baron et al. materials are granulate means that they are not in the form of the claimed cohesive matrix of mineral wool and ion-exchange agent at all. It should be noted that certain constituents mentioned in a different context by Baron et al. are not identified to have ion-exchange capacities, let alone at the disclosed and claimed level, so one skilled in the art cannot learn the claimed combination from Baron et al. It is important to note, for example, that Baron et al. mention zeolite in the same group as clay and bentonite, thus overlooking the fact that zeolite belongs to a different group than clay and bentonite when it is used as an ion-exchange agent.

In contrast to Baron et al., Applicants recognize the unique ion-exchange properties of zeolite, particularly when present with an optimal average pore size and concomitant surprisingly low water absorbency, and thus its stable ion-exchange capacity. Furthermore, there are over 130 different known framework structures of zeolite, and a general teaching of zeolite alone does not necessarily teach or suggest the claimed minimum ion-exchange capacity. Thus, although Baron et al. disclose soil minerals generally, Baron et al. neither teach nor suggest using certain minerals based on their particular unique ion-exchange capacities, let alone as an addition to a coherent matrix. Thus, Baron et al. provide no motivation to contemplate, much less to identify, the optimum ion-exchange capacities and ion-exchange agent volume percentages of Applicants' claimed invention, which invention overcomes the aforementioned problem of enormous swelling and shrinking typically seen in prior art cultivation materials.

Applicant claimed specific zeolite

Applicants submit, therefore, that the new and unexpected properties of the claimed invention inhere in the above-described particular optimum ranges of the coherent matrix of the mineral wool substrate and the ion-exchange agents. In contrast, Baron et al. are silent regarding any range properties, not because it would have been obvious to discover them through routine testing, but because Baron et al. do not contemplate, nor is their invention concerned with, the critical feature of the claimed invention, namely, a coherent matrix comprised of capillarity-improving agents selected for their particular ion-exchange capacities in order to overcome the enormous swelling and shrinking typically encountered in prior art cultivation supports.

Claim 20 stands rejected under 35 U.S.C. 103(a) as assertedly being unpatentable over Baron et al. in view of Clausen. Clausen teaches a substrate which is used as a growing block. Applicants do not rely on the "growing block" aspect of their claims for non-obviousness, but instead rely on the reasons advanced above.

Claims 23 and 27 stand rejected under 35 U.S.C. 103(a) as assertedly being unpatentable over Baron et al. in view of Schnuda. Schnuda teaches a growth medium using peat together with mineral wool to provide higher water retention. Again, because Baron et al. fail to teach or suggest the novel coherent matrix of mineral wool comprised of pore sizes less than 25 μm and up to 20 volume % of particular ion-exchange agents having an ion-exchange capacity of at least 15 meq/100g dry weight, the simple disclosure of peat by Schnuda does not make claims 23 or 27 obvious to one skilled in the art.

For all the foregoing reasons, claims 12-27 are novel and nonobvious over the cited prior art and in condition for allowance. Reconsideration of the rejections and allowance of all pending claims 12-27 are respectfully requested.

Respectfully submitted,

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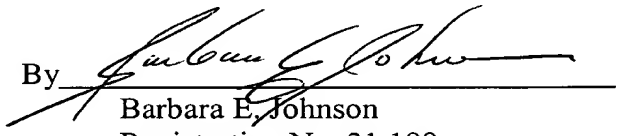
By 

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